

Index for The Computer Journal, Volume 32

1. Index of titles of Papers, etc

- A Comparison of JSD and DFD as Descriptive Tools 202
 A Compositional Model for Software Reuse 312
 A Fast Iterative Algorithm for Generating Set Partitions 281
 A Fixed-Size Bloom Filter for Searching Textual Documents 212
 A Las Vegas Graph Colouring Algorithm 474
 A New Algorithm for Generating Binary Trees using Rotations 470
 A Note on the DMC Data Compression Scheme 16
 A Proposal for Making Eiffel Type-safe 305
 A Query Facility to a Network DBMS 55
 A Window Manager for UNIX 21
 Algebraic Identities for Program Calculation 122
 An Approach to the Support of Software Evolution 386
 An Approximation Algorithm for Space-optimal Encoding of a Text 228
 An FP-based Design Methodology for Problem-oriented Architectures 453
 An Interactive Solution for the 4-peg Towers of Hanoi 187
 An Object-Based Taxonomy for Abstract Structure in Document Models 494
 An Optimising Compiler for a Modern Functional Language 152
 Announcements 12, 15, 23, 28, 54, 85, 89, 94, 95, 190, 201, 211, 219, 261, 266, 284, 304, 381, 398, 412, 431, 436, 444, 473, 515, 540, 553, 573
 Another Postage Stamp Problem 374
 AUTO-DFD: An Intelligent Data Flow Processor 194

 Book Review 532
 Browsing a la carte in Object-Oriented Databases 333

 Calculating Earthworks Volumes - An Exercise in Geometric Algorithms 377
 Classes of Admissible Permutations that are Generatable by Depth-first Traversals of Ordered Trees 76
 COMAR: A Data Format for Integration of CFG Tools 445
 Comparison of Hierarchic Agglomerative Clustering Methods for Document Retrieval 220
 Constructing Natural Language Interpreters in a Lazy Functional Language 108
 Correspondence 95, 282, 379
 Crossword Compilation Using Integer Programming 273
 Crossword Compiler-Compilation 276

 Data Encryption based upon Time Reversal Transformations 241
 Denotational Semantics of a Command Interpreter and their Implementation in Standard ML 422

 Editorial 97, 193, 289, 385, 481
 Effect of a Binary Symmetric Channel on the Synchronisation Recovery of Variable Length Codes 246
 Efficient Implementation of Rendezvous 267
 Eight Pieces Cannot cover a Chess Board 567
 Electronic Publishing - a Journal and its Production 482
 Explaining the Behaviour of Binary Search Trees Under Prolonged Updates: A Model and Simulations 68

 Fast Prototyping of a Goal-Oriented Simulation Environment System 541
 First Steps Towards Fully Abstract Semantics for Object-Oriented Languages 290
 Formal Hierarchical Object Models for Fast Template Matching 351
 Functional Programming and Operating Systems 162

 Generalizing Active Zones for Set-Theoretic Solid Models 86
 Generating Permutations on a VLSI Suitable Linear Network 571

 Human Resource Management and Business Success in Small, Hi-Tech Firms: Some Lessons from Data Processing 533
 HYPERTEXT - Moving Towards Large Volumes 516

 Implicit System Specification and the Interface Equation 399
 Inheritance and Kinds of Slots 63
 Inheritance in Actor Based Concurrent Object-Oriented Languages 297

- Multi-Destination Secure Electronic Mail 13

 Non-strict Languages - Programming and Implementation 142

 On Data Compaction of Scanning Curves 563
 On Implementing two Adaptive Data-compression Schemes 238
 On the conversion of Filled Polygonal Regions from Raster to Vector Representation 549

 Parallel Implementations of Functional Programming Languages 175
 Principles for the Design of a Distributed Memory Architecture for Parallel Graph Reduction 461
 Priority Semaphores 24
 Proving Correctness Properties of a Replicated Synchronous Program 437

 Rapidly Converging Iterative Formulae for Finding Square Roots and their Computational Efficiencies 93
 Recognition and Representation of a Hierarchy of Polygons with Holes 554
 Rendering Digital Type: A Historical and Economic View of Technology 524

 Semantically Driven Parsing of Context-free Languages 91
 Semantics and Problems of Universal Quantification in SQL 90
 Space Multiplexing of Waveguides in Optically Interconnected Multiprocessor Systems 362
 Standards for Structured Documents 505

 The Chalmers Lazy-ML Compiler 127
 The Nature of Information 262
 The Need for Reduced Byte Stream Instruction Sets 370
 The Parallel Interpretation of Logic Programs in Distributed Architectures 29
 The Solution of Mutual Exclusion Problems which can be Described Graphically 45
 The Treatment of Persistent Objects in Arjuna 323
 Towards a Formal Foundation for DeMarco Data Flow Diagrams 1
 Towards a Formal Specification of Floating Point 432
 Transport Protocol Requirements for Distributed Multimedia Information Systems 252
 Two-level Grammar as a Functional Programming Language 36

 UMIST OBJ: a Language for Executable Program Specifications 413

 Why Functional Programming Matters 98
 Writing Concurrent Object-Oriented Programs using Smalltalk-80 341

2. Index of Authors and Other Contributors

- Alexandridis, N. *see* Tsanakas, P.
 Allison, L. *see* McDonald, C.
 Augustsson, L. and Johnsson, T. 127

 Beach, R. J. *see* Brailsford, D. F.
 Bell, T. and Moffat, A. 16
 Bennett, J. P. and Smith, G. C. 370
 Berghel, H. and Yi, C. 276
 Bevan, D. I., Burn, G. L., Karia, R. J. and Robson, J. D. 461
 Bird, R. S. 122
 Bloss, Adrienne, Hudak, P. and Young, J. 152
 Bolloju, N. *see* Parimala, N.
 Brailsford, D. F. and Beach, R. J. 482
 Brown, Heather 505
 Burn, G. L. *see* Bevan, D. I.
 Bryant, B. R. *see* Edupuganty, B.

 Chiarulli, D. M. *see* Melhem, R. G.
 Chu, C.-K. *see* Shepherd, M. A.
 Chua, T. S. *see* Tan, K. P.
 Coleman, D. *see* Gallimore, R. M.

- Cook, W. R. 305
 Cooper, M. C. 351
 Corsini, P., Frosini, G. and Speranza, G. 29
 Cosnard, M. and Ferreira, A. G. 571
 Culberson, J. and Munro, J. I. 68
- Desarzens, Ph. *see* Schiper, A.
 Dixon, G. N., Parrington, G. D., Shrivastava, S. K. and Wheeler, S. M. 323
 Djokic, B., Miyakawa, M., Sekiguchi, S., Semba, I. and Stojmenovic, I. 281
- Eduuganty, B. and Bryant, B. R. 36
 Efremidis, S. *see* Sideri, M.
 El-Hamdouchi, A. and Willett, P. 220
 Ellis, J. A. and Lepolesa, P. M. 474
 Er, M. C. 76, 470
- Fairburn, J. *see* Wray, S. C.
 Ferreira, A. G. *see* Cosnard, M.
 Freisleben, B. and Keedy, J. L. 24
 Frosini, G. *see* Corsini, P.
 Frost, R. and Launchbury, J. 108
 Furuta, R. 494
- Gallimore, R. M., Coleman, D. and Stavridou, V. 413
 Godwin, A. N., Gore, M. B. and Salt, D. W. 202
 Gore, M. B. *see* Godwin, A. N.
- Hafner, B. J. *see* Robison, A. D.
 Halbert, A. R., Todd, S. J. P. and Woodward, J. R. 86
 Hekmatpour, S. 21
 Heuring, V. P., Kastens, U., Plummer, R. G. and Waite, W. M. 445
 Hopkins, T. P. and Wolczko, M. I. 341
 Hudak, P. *see* Bloss, Adrienne
 Hughes, J. 98
 Hutchinson, A. 63
- Jacob, R. T. *see* Page, I. P.
 Jamieson, M. J. 93
 Johnsson, T. *see* Augustsson, L.
 Jones, S. B. and Sinclair, A. F. 162
- Kafura, D. G. and Lee K. H. 297
 Karia, R. J. *see* Bevan, D. I.
 Kastens, U. *see* Heuring, V. P.
 Katajainen, J. and Raita, T. 228
 Keedy, J. L. *see* Freisleben, B.
 Kirby, G. H., Visvalingam, M. and Wade, P. 554
- Laenens, E., Staes, F. and Vermeir, D. 333
 Launchbury, J. *see* Frost, R.
 Lee, P. T. *see* Tan, K. P.
 Lee K. H., *see* Kafura, D. G.
 Lepolesa, P. M. *see* Ellis, J. A.
 Levitan, S. P. *see* Melhem, R. G.
 Levy, H. M. *see* Raj, R. K.
 Licker, P. S. 533
 Lu, X. M. 187
- Mäkinen, E. 238
 Mancini, L. V. and Pappalardo, G. 437
 McDonald, C. and Allison, L. 422
 Melhem, R. G., Chiarulli, D. M. and Levitan, S. P. 362
 Mikayawa, M. *see* Djokic, B.
 Misbahuddin, S. *see* Rahman, M.
 Mitchell, C. 13, 374
 Moffat, A. *see* Bell, T.
 Morris, R. A. 524
 Munro, J. I. *see* Culberson, J.
- Negri, M., Pelagatti, G. and Sbattella, L. 90
 Ngho, L. H. and Hopkins, T. P. 252
- Oxley, A. 377
- Page, I. P. and Jacob, R. T. 45
 Papakonstantinou, G. *see* Tsanakas, P., Sideri, M.
 Pappalardo, G. *see* Mancini, L. V.
- Parimala, N., Prakash, N., Rao, B. L. N. and Bolloju, N. 55
 Parker, J. R. 549
 Parrington, G. D. *see* Dixon, G. N.
 Pelagatti, G. *see* Negri, M.
 Peyton Jones, S. L. 175
 Phillips, W. J. *see* Shepherd, M. A.
 Plummer, R. G. *see* Heuring, V. P.
 Pong, L. *see* Tse, T. H.
 Pooch, U. W. *see* Umphress, D. A.
 Prakash, N. *see* Parimala, N.
- Quin, A. and Yanagisawa, Y. 563
- Rahman, M. and Misbahuddin, S. 246
 Raita, T. *see* Katajainen, J.
 Raj, R. K. and Levy, H. M. 312
 Rao, B. L. N. *see* Parimala, N.
 Ritchie, I. 516
 Robison, A. D., Hafner, B. J. and Skiena, S. S. 567
 Robson, J. D. *see* Bevan, D. I.
- Salt, D. W. *see* Godwin, A. N.
 Sbattella, L. *see* Negri, M.
 Scarrott, G. G. 262
 Schiper, A., Simon, R., Desarzens, Ph. and Sensttag, J.-A. 267
 Sekiguchi, S. *see* Djokic, B.
 Semba, I. *see* Djokic, B.
 Sensttag, J.-A. *see* Schiper, A.
 Shepherd, M. A., Phillips, W. J. and Chu, C.-K. 212
 Shields, M. W. 399
 Shrivastava, S. K. *see* Dixon, G. N.
 Sideri, M., Efremidis, S. and Papakonstantinou, G. 91
 Simon, R. *see* Schiper, A.
 Sinclair, A. F. *see* Jones, S. B.
 Skiena, S. S. *see* Robison, A. D.
 Smith, G. C. *see* Bennett, J. P.
 Sommerville, I. and Thomson, R. 386
 Speranza, G. *see* Corsini, P.
 Staes, F. *see* Laenens, E.
 Stavridou, V. *see* Gallimore, R. M.
 Stojmenovic, I. *see* Djokic, B.
- Tan, K. P., Chua, T. S. and Lee, P. T. 194
 Tanik, M. *see* Umphress, D. A.
 Todd, S. J. P. *see* Halbert, A. R.
 Tsanakas, P., Alexandridis, N. and Papakonstantinou, G. 453
 Tse, T. H. and Pong, L. 1
- Umphress, D. A., Pooch, U. W. and Tanik, M. 541
- Vermeir, D. *see* Laenens, E.
 Visvalingam, M. *see* Kirby, G. H.
- Wade, P. *see* Kirby, G. H.
 Waite, W. M. *see* Heuring, V. P.
 Wheeler, S. M. *see* Dixon, G. N.
 Wichmann, B. A. 432
 Willett, P. *see* El-Hamdouchi, A.
 Wilson, J. M. 273
 Wolczko, M. I. *see* Hopkins, T. P.
 Woodward, J. R. *see* Halbert, A. R.
 Wray, S. C. and Fairbairn, J. 142
- Yanagisawa, Y. *see* Quin, A.
 Yelland, P. M. 290
 Yi, C. *see* Berghel, H.
 Young, J. *see* Bloss, Adrienne
 Yu, K. W. and Yu, T. L. 241

3. Index of Topics, etc

- Abstract data types 312, 413
 Abstract machines 142
 Active zone 86
 Adaptive coding 238
 Admissible permutations 76
 ALFL 152
 Algebraic identities 122
 Algebraic models 290

- Algebraic specification language 399, 413
- Algorithms 16, 554
- AND parallelism 29
- AND process 29
- Annotations 175
- Area topology 554
- Arithmetic coding 16
- Artificial intelligence 63, 98
- Atomic actions 323
- Attribute grammars 91, 445
- Authentication 13
- Automatic building 386
- Automatic classification 220
- Axiomatic proofs 437

- Backtracking parallelism 29
- Bandwidth 362
- Baye's rule 351
- Behaviour abstraction 297
- Best match retrieval 220
- Binary search tree 68
- Binary strings 76
- Binary symmetric codes 246
- Binary trees 470
- BLEND 482
- Bloom filters 212
- Browsing 333
- Building 377
- Business success 533
- Byte stream instruction sets 370

- Caches 175
- Calculus of communicating systems 399
- Cartography 549, 554
- CASE tool 194
- Chess 567
- Chessboards 567
- Civil engineering 377
- Clausal form 273
- Clipping 377
- Cluster analysis 220
- Clustering methods 220
- Coarse indexing 212
- Code generation 142
- Code management 312
- Codewords 470
- COMAR 445
- Combinatorial algorithms 470
- Combinatorial computing 567
- Combinatorics 273
- Command interpreters 422
- Communicating processes 162
- Communication 262
- Comparison of systems methodologies 202
- Compilation 127, 276
- Compiler construction 445
- Complement 76
- Complete linkage clustering method 220
- Computational efficiency 93
- Computer architectures 370
- Computer graphics 563
- Computer vision 351
- Concurrency 297
- Concurrent programming 341
- Configuration management 386
- Content architecture 505
- Context free grammar 445
- Context free languages 36
- Contours 377
- Convergence 93
- Converse reverse 76
- Coverings 567
- Crossword 276
- Crossword compilation 276
- Cryptography 13
- Cut and Fill 377

- Data base management 55
- Data compaction 563
- Data compression 16, 228, 238, 351
- Data encryption 241
- Data flow diagrams 1, 194, 202
- Data flow processor 194
- Data format 445
- Data integrity 13
- Data management 90
- Data models 554
- Data security 13
- Data structures 554
- Data transmission 241, 246
- Database retrieval 55
- Database update 55
- Databases 333, 554
- Datagram 252
- DDL 494
- Deadlock 45
- Debugging 341
- Declarative languages 142
- Delegation 297
- Denotational semantics 290, 422
- Dependency graph 91
- Depth - first interpreter 29
- Depth-first traversals 76
- Derivation 91
- Description methods 202
- Design languages 36
- Device driving 162
- Dialogue design 21
- Difference sets 374
- Digital type 524
- Direct manipulation 333
- Discourse 55
- Discrete Peano curves 563
- Distributed agreement 437
- Distributed architectures 29
- Distributed document processing 252
- Distributed memory architectures 453, 461
- Distributed systems 252, 323, 437
- Document access 212
- Document clustering 220
- Document description language 494
- Document preparation 494

- Edge-detection operators 351
- Eiffel 297, 305
- Electronic mail 13
- Electronic mail security 13
- Electronic publishing 482, 494
- Encryption 13
- EP-odd 482
- Error tolerance 238
- Ethernet 252
- Evaluation strategies 341
- Evaluation transformers 453, 461
- Executable specifications 413
- Extensible languages 36

- Fast algorithm 281
- Fault tolerance 323, 437
- Filled polygonal regions 549
- Final algebra 290
- Finite context automata 16
- Finite lists 122
- Finite state automata 16
- Floating point 432
- Formal correctness 437
- Formal specification 413, 422, 432
- Fourier transform 351
- Frames 63
- Full abstraction 290
- Functional languages 152, 453, 461
- Functional programming 36, 98, 108, 122, 127, 142, 152, 162, 175, 422

- Generating algorithm 281
- Generating binary trees 470
- Generating codewords 470
- Generic procedures 312

- G-machine 127
- Goal-oriented 541
- Golomb rulers 374
- GPSS 541
- Graph colouring 474
- Graph reduction 175
- Graphical object classes 333
- Graphics editor 194
- Graphics input 377
- Graphics metafile resource 194
- GRIP 175
- Group average clustering method 220
- GUIDE 516

- Hierarchical models 351
- Higher order functions 162
- Hoare logic 437
- Holes in polygons 554
- Horn clauses 273
- Huffman coding 246
- Human resource management 533
- Hypertext 516

- Iconic interface 194
- IDEX 516
- Implicit system specification 399
- Incremental evaluator 91
- Indexes for document access 212
- Information 262
- Information processing 194
- Information retrieval 220
- Inheritance 63, 297, 312
- Inspection of printed circuit boards 351
- Integer programming 273
- Integrated project support environments 386
- Interactive graphical editing 86
- Interactive systems 21
- Interactive software 162
- Intermediate language 445
- Interpreters 36
- Interprocess message 29
- Interval coding 238
- Inverse 76
- Involution 76
- Isomorphisms 563
- Iterative process 93

- Jackson Systems Development 202
- Journal publishing 482
- Judgement 262

- KD-trees 567
- Key management 13
- Knowledge representation 63
- Koses 63

- Land surveying 377
- Language interpreter 341
- Language translation 108
- Language translators 445
- Languages 91
- Latency 175
- Lattice paths 470
- Lazy evaluation 142, 162
- Lazy-ML 127
- Legibility 524
- Letter rendering 524
- Lexicographic order 470
- Linear network 571
- Linear programming 273
- Linear search 238
- Load sharing 175
- Logic languages 29
- Logic programming 29

- Mail 252
- Majority voting 437
- Markov modelling 16
- Mark-up 494

- Mathematical logic 273
- Matrix generation 273
- Metalanguages 36, 422
- Mini-specs 194
- Miranda 108, 122, 127
- Model construction 541
- Model interconnection languages 386
- Modelling 16
- Modula-2 267
- Modular redundancy 437
- Modularization 312
- Monte Carlo methods 474
- Move-to-front rule 238
- Multicast 252
- Multimedia information 252
- Multiplexing 362
- Multi-processing 341
- Multiprocessor 267
- Multiprocessor systems 362
- Mutual exclusion 45

- Natural language 108
- Nearest neighbour clusters 220
- Network 252
- Network data model 55
- Non-determinism 162
- Non-procedural languages 36
- Non-recursion 187
- Non-strict evaluation 142
- NP-complete 474
- Numerical methods 93

- Object-oriented languages 290
- Object-oriented programming 290, 297, 305, 312, 323, 333, 341
- Observable behaviour 290
- Observational congruence 290
- ODA 505
- Operating systems 162
- Optical waveguides 362
- Optimal encoding 228
- Optimisation 273
- Optimising compilers 152
- OR parallelism 29
- OR process 29
- Order of convergence 93
- Ordered trees 76
- Organisation 262

- Packet 252
- Page Description Language 494
- Parallel algorithms 571
- Parallel computation 93
- Parallel computer architecture 175
- Parallel graph reduction 453, 461
- Parallel programming 341
- Parallelism 162, 267, 351
- Parallelism control 341
- Parse tree 91
- Parsing 91
- Path Expressions 24
- Pattern matching 122, 127
- PDL 494
- Peeppole refinement 370
- Performance evaluation 281
- Permutations and combinations 571
- Persistence 323
- Petri nets 1
- Pipelining 362
- Polygons 554
- Postage stamp problem 374
- PostScript 482, 524
- Primitive regions 554
- Process networks 162
- Process scheduling 24
- Program calculation 122
- Programming environments 312
- Programming languages 312
- Programming techniques 142
- Programming-in-the-large 386

Prolog 29, 273
Prolonged updating 68
Pseudo random numbers 563

Quadrees 351, 563
Quantity surveying 377
Query languages 55, 90

Random ellipses 563
Raster graphics 563
Readability 524
Reader writer problem 24
Real time conferencing 252
Reduced instruction sets 370
Reliability 437
Rendezvous 267
Replicated processing 437
Resource management 175
RISC 370
Routing algorithm 194
Run length 563

Scanning curves 563
Scheduling 175
Security 13
Self-adjusting data structure 238
Semantic analysis 108, 152
Semantic condition 91
Semantically driven parsing 91
Semantics 63, 91
Semaphores 24, 45
Sequential computation 93
Set partition 281
Set-theoretic model 86
SGML 482, 505
Shortest paths 228
Signatures 212
Simulation 563
Simulation languages 541
Single linkage clustering method 220
Slots 63
Smalltalk-80 341
Software components 312
Software engineering 194, 312, 413
Software reuse 312
Solid model 86
Specification languages 36
SQL 90
Square root 93
Stack permutation 76
Standards 505
Starvation 45
Statistical test 563
Streams 162
String matching 228
Structured analysis 1, 194

Structured design 1, 194
Structured documents 494, 505
Structured programming 98, 312
Structured software 98
Superimposed coding 212
Support tools 413
Synchronisation 24, 175
Synchronisation recovery 246
Synchronous communication 267
Synchronous programs 437
System design 399
System design tool 194
System specification 399
System structure 386
Systems analysis 202
Systems methodology assessment 202

TCP/IP 252
Template matching 351
Text compression 16
Text retrieval 212
Textual substitution 228
Time reversal transformations 241
Tool integration 445
Top-down programming 36
Topological maps 554
Towers of Hanoi 187
Tracing 341
Transitive relations 63
Transport protocol 252
Transpose rule 238
Tree permutation 76
Tree rotation 470
Tree structures 554
Trie 238
Two-level grammar 36
Two-level machine model 228
Type redefinition 305
Type-correct 305

Universal quantification 90
UNIX 21
USENET cookbook 482

Vector graphics 549
Very high-level languages 36
Vienna Development Method 432
Visual inspection 351
VLSI 571

Ward's clustering method 220
Window management 21
Word signatures 212

Zykov tree 474